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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/381,839	09/24/1999	GUNTER DOEMENS	P99.1690	4490
30596	7590	11/08/2007		
HARNESS, DICKEY & PIERCE, P.L.C. P.O.BOX 8910 RESTON, VA 20195			EXAMINER LAROSE, COLIN M	
			ART UNIT 2624	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/381,839

Applicant(s)

DOEMENS ET AL.

Examiner

Colin M. LaRose

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-6 and 8-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6 and 8-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Amendments and Remarks

1. Applicant's amendments and remarks dated 18 October 2007, have been entered and made of record.

Claim Rejections - 35 USC § 112

2. In view of Applicant's amendment to claim 4 and cancellation of claim 7, the previous § 112 rejections have been withdrawn.

Response to Amendments and Remarks

3. Applicant's arguments regarding claim 4 have been considered but are unpersuasive. Claim 4 is substantially identical to the previously-appealed claim 4, except it excludes the "evaluating" step. On February 16, 2007, the Board of Patent Appeals and Interferences affirmed the Examiner's § 103 rejection of the previously-appealed claim 4, and that rejection is equally applicable to the currently amended claim 4.
4. Regarding claim 9, Di Matteo teaches that the reference surface need not be utilized—mathematical equations can be used instead (see column 10/45-50).
5. Regarding claims 10 and 11, although the disclosure of Di Matteo (U.S. 4,511,252) appears to be directed to the use of multiple cameras, a different disclosure of Di Matteo (U.S. 4,508,452) teaches substantially the same imaging system except that only a single camera is utilized (see figure 1). Di Matteo '452 teaches that the object may be rotated in order to image the entire surface of the object (see column 10/19-38). However, such a rotation of the object does

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not appear be a requirement of the system—the single camera 40 can "always register a same perspective of the object" such that the object, as well as the camera, are not moved during the imaging process.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,511,252 by Di Matteo ("Di Matteo") in view of U.S. Patent 5,905,545 by Poradish ("Poradish").

Regarding claim 4, Di Matteo discloses a method for identification (i.e. identification of three depth planes; column 11, lines 56-58) of an object having an object surface, said method comprising:

successively projecting a number of encoded illumination patterns (column 1, lines 61-66, and figure 5) to sequentially illuminate said object surface with at least three colors (figure 5) in a beam path through a variable filter (column 5, lines 28-31) onto said object surface for identification of at least three depth planes of said object in a single image;

registering said image of said object with a color camera from a direction different from said beam path (figure 1a); and

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determining a 3-D image of a topography of said object surface from said registration in a control and evaluation unit (column 1, lines 28-32, and computer 48, figure 4 that reconstructs the object's surface), the determining including the use of at least triangulation principles (column 11, lines 56-68 and column 15, lines 1-12: the Z coordinate of points on the object is determined by the color masks shown in figures 2-5, whereas the X and Y coordinates are calculated via triangulation principles; see also column 7, lines 56-68 and column 14, lines 57-68 for details of the triangulation).

Di Matteo utilizes a standard projection system and thus is silent to sequentially illuminating a digital micro mirror arrangement via a light source of at least three colors and driving the digital micro mirror arrangement to sequentially illuminate the object.

Poradish discloses the operation of a digital micromirror device (DMD) in a projection system (figure 1). The color wheel 20a ("variable color filter") sequentially transmits red, green, and blue light to the light modulator 30a, which comprises a DMD. Then the light is projected through a lens 32a onto the screen. Column 3, lines 26-53.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Di Matteo by Poradish to illuminate a digital micro mirror arrangement via a light source and drive the digital micro mirror arrangement to sequentially illuminate an object, since Poradish discloses that replacing a full-color projection display with a digital micro mirror arrangement that sequentially displays red, green, and blue light is preferred because the DMD reduces the amount of system hardware (column 1, lines 63-66).

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Regarding claim 5, Di Matteo discloses the encoded illumination patterns comprising a stripe pattern having successively varied periodicity (figure 5).

Regarding claim 8, Di Matteo discloses the determining a 3-D image includes comparing said image of said object with pre-stored data (column 7/17-22 and figure 8: a pre-stored reference surface is compared to the image of the object).

Regarding claim 9, Di Matteo discloses that the determining a 3-D image does not require comparing said object surface with a reference surface (column 10/45-50: mathematical equations can be used instead of a reference surface).

8. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,508,452 by Di Matteo ("Di Matteo '452") in view of U.S. Patent 5,905,545 by Poradish ("Poradish").

Regarding claims 10 and 11, Di Matteo '452 discloses a method/system (figure 1) for identification of an object having an object surface, said method comprising:

a projector (projector 26) successively projecting a number of encoded illumination patterns (figure 5) to sequentially illuminate said object surface with at least three colors in a beam path through a variable filter (column 6, lines 9-14: alternating red, green, and blue bands) onto said object surface for identification of at least three depth planes of said object in a single image;

a single color camera (camera 40) arranged to having [sic] a same perspective of said object surface and configured to register said image of said object from a direction different from said beam path (as shown in figure 1); and

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an evaluation unit (computer 48, figure 4) configured to determine a 3-D image of a topography of said object surface from said image registered by the single color camera using triangulation principles (see columns 13/31-15/3: the 3-D points on the surface of the object are determined by applying triangulation principles to the intersection of a line and a plane, as shown in figures 18-20).

Di Matteo '452 utilizes a standard projection system and thus is silent to sequentially illuminating a digital micro mirror arrangement via a light source of at least three colors and driving the digital micro mirror arrangement to sequentially illuminate the object.

Poradish discloses the operation of a digital micromirror device (DMD) in a projection system (figure 1). The color wheel 20a ("variable color filter") sequentially transmits red, green, and blue light to the light modulator 30a, which comprises a DMD. Then the light is projected through a lens 32a onto the screen. Column 3, lines 26-53.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Di Matteo '452 by Poradish to provide a digital micro mirror arrangement and associated control circuitry to sequentially illuminate the object surface the via a light source, since Poradish discloses that replacing a full-color projection display with a digital micro mirror arrangement that sequentially displays red, green, and blue light is preferred because the DMD reduces the amount of system hardware (column 1, lines 63-66).

Regarding claim 12, Di Matteo '452 discloses that the encoded illumination patterns include a stripe pattern having successively varied periodicity (see e.g., figure 5).

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9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,511,252 by Di Matteo ("Di Matteo") in view of U.S. Patent 5,905,545 by Poradish ("Poradish"), and further in view of U.S. Patent 4,846,577 by Grindon ("Grindon").

Regarding claim 6, Di Matteo does not appear to disclose or suggest the intended use of face identification. However, Grindon shows that, at the time the invention was made, utilizing an optical projection system for identifying the topography of a face was well-known to those skilled in the art—see figure 1. Accordingly, utilizing the above combination of Di Matteo and Poradish for identifying the 3-D surface of a face was an obvious application at the time the invention was made.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,508,452 by Di Matteo ("Di Matteo '452") in view of U.S. Patent 5,905,545 by Poradish ("Poradish"), and further in view of U.S. Patent 4,846,577 by Grindon ("Grindon").

Regarding claim 13, Di Matteo '452 does not appear to disclose or suggest the intended use of face identification. However, Grindon shows that, at the time the invention was made, utilizing an optical projection system for identifying the topography of a face was well-known to those skilled in the art—see figure 1. Accordingly, utilizing the above combination of Di Matteo '452 and Poradish for identifying the 3-D surface of a face was an obvious application at the time the invention was made.

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Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (571) 272-7423. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner, can be reached on (571) 272-7401. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000. Any inquiry of a general nature or relating to the status of this application or proceeding can also be directed to the TC 2600 Customer Service Office whose telephone number is (571) 272-2600.



Colin M. LaRose
Group Art Unit 2624
6 November 2007